

CLAIMS

1. A dispersant compound comprising an acrylic backbone having a plurality of pendant anionic groups and a stabilizing substituent, the stabilizing substituent comprising an alkoxy-terminated polyalkylene oxide of the formula
- $$-D(CHR_1CH_2O)_nR_2,$$
- wherein D is a divalent radical that is -O- or -NR₃-, R₃ is hydrogen or an alkyl group of from one to twelve carbons, R₁ is hydrogen or an alkyl group of from one to eight carbons, R₂ is an alkyl group of from one to thirty carbons, and n is an integer from one to one thousand
2. The dispersant compound of claim 1 wherein the acrylic backbone has a number average molecular weight of from 2000 to 50,000.
3. The dispersant compound of claim 1 wherein the the stabilizing substituent is linked to the acrylic backbone through urethane or urea linkages.
4. The dispersant compound of claim 1 wherein the stabilizing substituent is linked to the acrylic backbone through β -hydroxy ester linkages or β -hydroxy amine linkages.
5. The dispersant compound of claim 1 wherein the plurality of anionic groups result from the reaction of a plurality of carboxylic acid groups with a basic compound selected from the group consisting of organic amines, hydroxide containing compounds, and mixtures thereof.
6. The dispersant compound of claim 5 wherein the plurality of carboxylic acid groups are only partially reacted with a basic compound.
7. The dispersant compound of claim 6 wherein the plurality of carboxylic acid groups are reacted with an organic amine such that from 50 to 75% of the carboxylic acid groups are neutralized.

8. The dispersant compound of claim 5 wherein the plurality of carboxylic acid groups are reacted with one or more organic amines.

5 9. The dispersant compound of claim 8 wherein the plurality of carboxylic acid groups are reacted with a tertiary amine.

10 10. The dispersant compound of claim 1 wherein D is selected from the group consisting of -O- and -NH-.

11. The dispersant compound of claim 1 wherein R₁ is hydrogen and R₂ is methyl.

12. The dispersant compound of claim 11 wherein n is from 20 to 200.

13. The dispersant compound of claim 1, wherein n is from 30 to 70.

15 14. A dispersant compound consisting of an acrylic backbone having a plurality of pendant anionic groups and a stabilizing substituent, the stabilizing substituent comprising an alkoxy-terminated polyalkylene oxide of the formula



20 wherein D is a divalent radical that is -O- or -NR₃-, R₃ is hydrogen or an alkyl group of from one to twelve carbons, R₁ is hydrogen or an alkyl group of from one to eight carbons, R₂ is an alkyl group of from one to thirty carbons, and n is an integer from one to one thousand.

25 15. A method of dispersing a pigment, comprising the steps of:

(a) adding a pigment to a mixture comprising the pigment dispersant of claim 1, water, and a cosolvent,

(b) mixing the pigment and the mixture to form a premix, and

30 (b) grinding the premix to produce a dispersion in which the maximum particle size of the pigment is less than six microns.

16. An electrocoat coating composition comprising:

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- (a) an aqueous dispersion of a water-dispersible, electrically-depositable, at least partially neutralized anionic resin;
- (b) a dispersant compound comprising an acrylic backbone having a plurality of anionic groups and a stabilizing substituent, and the stabilizing substituent comprises an alkoxy-terminated polyalkylene oxide of the formula



wherein D is a divalent radical that is -O- or -NR₃-, R₃ is H or an alkyl group of from one to twelve carbons, R₁ is hydrogen or an alkyl group of from one to eight carbons, R₂ is an alkyl group of from one to thirty carbons, and n is an integer from one to one thousand, and

- (c) at least one pigment that is dispersed with the dispersant compound (b).

17. The coating composition of claim 16 wherein the anionic resin (a) comprises an epoxy resin functionalized with a plurality of acid groups, at least some of which have been neutralized.

18. The coating composition of claim 16 wherein the anionic resin (a) comprises a carbamate functional resin having a plurality of acid groups, at least some of which have been neutralized.

19. The coating composition of claim 16 further comprising a crosslinker that can be reacted with the anionic resin after deposition of the coating on a substrate to form a crosslinked film on the substrate.

20. The coating composition of claim 19 wherein the crosslinker is selected from the group consisting of blocked polyisocyanate compounds, aminoplast resins, and mixtures thereof.

21. The coating composition of claim 16 wherein the plurality of anionic groups result from the reaction of a plurality of carboxylic acid groups with a basic compound selected from the group consisting of organic amines, hydroxide containing compounds, and mixtures thereof.

22. The dispersant compound of claim 21 wherein the plurality of carboxylic acid groups are only partially reacted with a basic compound.

5 23. The dispersant compound of claim 22 wherein the plurality of carboxylic acid groups are reacted with an organic amine such that from 50 to 75% of the carboxylic acid groups are neutralized.

10 24. The dispersant compound of claim 21 wherein the plurality of carboxylic acid groups are reacted with one or more organic amines.

25. The dispersant compound of claim 24 wherein the plurality of carboxylic acid groups are reacted with a tertiary amine.

15 26. A method of coating a substrate comprising the steps of
(a) electrodepositing the coating composition of claim 1 onto the substrate; and
(b) curing the coating composition deposited on the substrate.

27. A coated article that has been coated according to the method of claim 26.

20 28. A coated article according to claim 27 wherein the coated article is an automotive part or body.

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